UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/995,118	11/27/2001	Feng Ying	TI-31204	1974

23494 7590 11/02/2004

TEXAS INSTRUMENTS INCORPORATED
P O BOX 655474, M/S 3999
DALLAS, TX 75265

EXAMINER	
AGGARWAL, YOGESH K	
ART UNIT	**PAPER NUMBER**
2615	

DATE MAILED: 11/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/995,118	YING ET AL.	
	Examiner	Art Unit	
	Yogesh K Aggarwal	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,9,14,17,19-23,26,29-32,35 and 36* is/are rejected.

7)☒ Claim(s) *3-8,10-13,15,16,18,24,25,27,28,33 and 34* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 November 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *03/12/2002*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Drawings

1. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim19 is objected to because of the following informalities:

"the third sampling switch" should be "a third sampling switch".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mangelsdorf (US Patent # 6,018,364) in view of Shimaya et al. (US Patent # 5,579,049).

[Claim 1]

Mangelsdorf teaches an image processing apparatus having offset and optical black correction circuit (col. 10 lines 33-35, figure 12) coupled to receive an optical black signal from a charge coupled device (figure 12, element 12), comprising a first circuit (77") to sample the optical black signal at a predetermined reference voltage, the first circuit comprises a correlated double sampler (figure 12, element 71) a second programmable gain amplifier (30), an adder (58) coupled to the second programmable gain amplifiers (30) , wherein the correction circuit couples to the adder to add the positive and negative difference to the optical black signal (col. 9 lines 43-46), an analog-to-digital converter (38) coupled to the second programmable gain amplifier (30) for converting the sampled signal into a digital signal, a second circuit to correct the optical black offset coupled to the first circuit, the second circuit comprises i. a reverse programmable gain amplifier (140) coupled to the analog-to-digital converter (38) to amplify the optical black level of the digital signal and an integrator (66) coupled to the reverse programmable gain amplifier (140) to detect the optical black level of the digital signal wherein the integrator (66) couples to the adder (58). Mangelsdorf fail to teach a first programmable gain amplifier coupled to the CDS so that the adder is connected between the first and second programmable gain amplifier. However Shimaya et al. teaches a pre-amplifier 13 (read as a first PGA) coupled to the CDS 12 and a GCA 16 (figure 1) in order to amplify a video signal depending upon its gain corresponding to the gain control signal applied (col. 6 lines 60-67). Therefore taking the combined teachings of Mangelsdorf and Shimaya et al. it would have been obvious to one skilled in the art at the time of the invention to have been motivated to have a first programmable gain amplifier coupled to the CDS as taught in Shimaya so that the adder is connected between the first and second programmable gain amplifier. The benefit of doing so is that the pre-amplifier

circuit 13 (first PGA) can be used to change the level of input signal greatly as compared to the second PGA which is used when the level of the input signal changes only finely as taught in Shimaya (col. 6 lines 65-67, col. 7 lines 1-2).

[Claim 36]

This is a method claim corresponding to apparatus claim 1. Therefore grounds for rejecting claim 1 apply for claim 36 completely.

5. Claims 2, 9, 14, 17,19-23, 26, 29, 30, 31, 32 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mangelsdorf (US Patent # 6,018,364), Shimaya et al. (US Patent # 5,579,049) and in further view of Domer et al. (US Patent # 6,346,968).

[Claim 2]

Mangelsdorf in view of Shimaya fail to teach "the first programmable gain amplifier comprising a first and second sampling circuit, a differential amplifier having a first and second input and a first and second output, the first sampling circuit coupled to the first input, the second sampling circuit coupled to the second input; and a first and second feedback circuit, the first feedback circuit coupled between the first input and the first output, the second feedback circuit coupled between the second input and the second output". However Domer et al. teaches a programmable gain amplifier (figure 3) comprising a first (322 and 324) and second sampling circuit (332 and 324), a differential amplifier (302) having a first and second input and a first and second output, the first sampling circuit coupled to the first input, the second sampling circuit coupled to the second input and a first (310 and 314) and second feedback (311 and 315) circuit, the first feedback circuit coupled between the first input and the first output, the second feedback circuit coupled between the second input and the second output (See figure 3). Therefore taking

the combined teachings of Mangelsdorf, Shimaya and Domer, it would have been obvious to one skilled in the art at the time of the invention to have been motivated to have a programmable gain amplifier comprising a first and second sampling circuit, a differential amplifier having a first and second input and a first and second output, the first sampling circuit coupled to the first input, the second sampling circuit coupled to the second input; and a first and second feedback circuit, the first feedback circuit coupled between the first input and the first output, the second feedback circuit coupled between the second input and the second output in order to amplify the video signals. The benefit of using a PGA having a single amplifier approach is to color balance pixel signals without introducing FPN and other display artifacts as taught in Domer (col. 4 lines 45-49).

[Claim 9]

Mangelsdorf in view of Shimaya fail to teach "the first programmable gain amplifier comprising a sampling circuit, an amplifier having an input and an output, the sampling circuit coupled to the input and a feedback circuit coupled between the input and the output". However Domer et al. teaches a programmable gain amplifier (figure 3) comprising a (322 and 324), an amplifier (302) having an input and an output, the sampling circuit coupled to the input, a feedback circuit (310 and 314) coupled between the input and output. Therefore taking the combined teachings of Mangelsdorf, Shimaya and Domer, it would have been obvious to one skilled in the art at the time of the invention to have been motivated to have a first programmable gain amplifier comprising a sampling circuit, an amplifier having an input and an output, the sampling circuit coupled to the input and a feedback circuit coupled between the input and the output. The benefit

of using a PGA having a single amplifier approach is to color balance pixel signals without introducing FPN and other display artifacts as taught in Domer (col. 4 lines 45-49).

[Claim 14]

This claim is similar to claim 2 except that it refers to the second programmable amplifier. Therefore grounds for rejecting claim 2 apply for claim 14 completely.

[Claim 17]

Domer discloses that the first (322, 321, 312) and second (332, 331,313) sampling circuits are equivalent (figure 3).

[Claim 19]

Domer teaches that the first (323, 324) and second sampling switch (333, 334) closes on the first phase (figure 4, T1) of the control signal (col. 5 lines 35-45).

[Claim 20]

Domer teaches in figure 3 that the first (figure 3, element 310, 314) and second (figure 3, element 311, 315) feedback circuits are equivalent.

[Claim 21]

This claim is similar to claim 9 except that it refers to the second programmable amplifier. Therefore grounds for rejecting claim 9 apply for claim 21 completely.

[Claim 22]

Domer teaches that the sampling circuit comprises a sampling switch (figure 3, element 324) and a variable capacitor (322) connected to the first sampling switch (figure 3, element 324).

[Claim 23]

This claim is similar to claim 19 except that it refers to the second programmable amplifier. Therefore grounds for rejecting claim 19 apply for claim 21 completely.

[Claim 26]

Mangelsdorf teaches an image processing apparatus having offset and optical black correction circuit (col. 10 lines 33-35, figure 12) coupled to receive an optical black signal from a charge coupled device (figure 12, element 12), comprising a first circuit (77") to sample the optical black signal at a predetermined reference voltage, the first circuit comprises a correlated double sampler (figure 12, element 71) a second programmable gain amplifier (30), an adder (58) coupled to the second programmable gain amplifiers (30) , wherein the correction circuit couples to the adder to add the positive and negative difference to the optical black signal (col. 9 lines 43-46), an analog-to-digital converter (38) coupled to the second programmable gain amplifier (30) for converting the sampled signal into a digital signal. Mangelsdorf fail to teach a first programmable gain amplifier coupled to the CDS so that the adder is connected between the first and second programmable gain amplifier. However Shimaya et al. teaches a pre-amplifier 13 (read as a first PGA) coupled to the CDS 12 and a GCA 16 (figure 1) in order to amplify a video signal depending upon its gain corresponding to the gain control signal applied (col. 6 lines 60-67). Therefore taking the combined teachings of Mangelsdorf and Shimaya et al. it would have been obvious to one skilled in the art at the time of the invention to have been motivated to have a first programmable gain amplifier coupled to the CDS as taught in Shimaya so that the adder is connected between the first and second programmable gain amplifier. The benefit of doing so is that the pre-amplifier circuit 13 (first PGA) can be used to change the level of input signal

greatly as compared to the second PGA which is used when the level of the input signal changes only finely as taught in Shimaya (col. 6 lines 65-67, col. 7 lines 1-2).

Mangelsdorf in view of Shimaya fail to teach "a second circuit comprising a first and second sampling circuit, a differential amplifier having a first and second input and a first and second output, the first sampling circuit coupled to the first input, the second sampling circuit coupled to the second input; and a first and second feedback circuit, the first feedback circuit coupled between the first input and the first output, the second feedback circuit coupled between the second input and the second output". However Domer et al. teaches a programmable gain amplifier (figure 3) comprising a first (322 and 324) and second sampling circuit (332 and 324), a differential amplifier (302) having a first and second input and a first and second output, the first sampling circuit coupled to the first input, the second sampling circuit coupled to the second input and a first (310 and 314) and second feedback (311 and 315) circuit, the first feedback circuit coupled between the first input and the first output, the second feedback circuit coupled between the second input and the second output (See figure 3). Therefore taking the combined teachings of Mangelsdorf, Shimaya and Domer, it would have been obvious to one skilled in the art at the time of the invention to have been motivated to have a programmable gain amplifier comprising a first and second sampling circuit, a differential amplifier having a first and second input and a first and second output, the first sampling circuit coupled to the first input, the second sampling circuit coupled to the second input; and a first and second feedback circuit, the first feedback circuit coupled between the first input and the first output, the second feedback circuit coupled between the second input and the second output in order to amplify the video signals.

The benefit of using a PGA having a single amplifier approach is to color balance pixel signals without introducing FPN and other display artifacts as taught in Domer (col. 4 lines 45-49).

[Claim 29]

Domer discloses that the first (322, 321, 312) and second (332, 331,313) sampling circuits are equivalent (figure 3).

[Claim 30]

Domer teaches a feedback capacitor 310 in the feedback loop(figure 3).

[Claim 31]

Domer teaches in figure 3 that the first (figure 3, element 310, 314) and second (figure 3, element 311, 315) feedback circuits are equivalent.

[Claim 32]

Mangelsdorf teaches an image processing apparatus having offset and optical black correction circuit (col. 10 lines 33-35, figure 12) coupled to receive an optical black signal from a charge coupled device (figure 12, element 12), comprising a first circuit (77") to sample the optical black signal at a predetermined reference voltage, the first circuit comprises a correlated double sampler (figure 12, element 71) a second programmable gain amplifier (30), an adder (58) coupled to the second programmable gain amplifiers (30) , wherein the correction circuit couples to the adder to add the positive and negative difference to the optical black signal (col. 9 lines 43-46), an analog-to-digital converter (38) coupled to the second programmable gain amplifier (30) for converting the sampled signal into a digital signal. Mangelsdorf fail to teach a first programmable gain amplifier coupled to the CDS so that the adder is connected between the first and second programmable gain amplifier. However Shimaya et al. teaches a pre-amplifier 13

(read as a first PGA) coupled to the CDS 12 and a GCA 16 (figure 1) in order to amplify a video signal depending upon its gain corresponding to the gain control signal applied (col. 6 lines 60-67). Therefore taking the combined teachings of Mangelsdorf and Shimaya et al. it would have been obvious to one skilled in the art at the time of the invention to have been motivated to have a first programmable gain amplifier coupled to the CDS as taught in Shimaya so that the adder is connected between the first and second programmable gain amplifier. The benefit of doing so is that the pre-amplifier circuit 13 (first PGA) can be used to change the level of input signal greatly as compared to the second PGA which is used when the level of the input signal changes only finely as taught in Shimaya (col. 6 lines 65-67, col. 7 lines 1-2). Mangelsdorf in view of Shimaya fail to teach "the first programmable gain amplifier comprising a sampling circuit, an amplifier having an input and an output, the sampling circuit coupled to the input and a feedback circuit coupled between the input and the output". However Domer et al. teaches a programmable gain amplifier (figure 3) comprising a (322 and 324), an amplifier (302) having an input and an output, the sampling circuit coupled to the input, a feedback circuit (310 and 314) coupled between the input and output. Therefore taking the combined teachings of Mangelsdorf, Shimaya and Domer, it would have been obvious to one skilled in the art at the time of the invention to have been motivated to have a first programmable gain amplifier comprising a sampling circuit, an amplifier having an input and an output, the sampling circuit coupled to the input and a feedback circuit coupled between the input and the output. The benefit of using a PGA having a single amplifier approach is to color balance pixel signals without introducing FPN and other display artifacts as taught in Domer (col. 4 lines 45-49).

[Claim 35]

Domer teaches a feedback capacitor 310 in the feedback loop(figure 3).

Allowable Subject Matter

6. Claims 3-8, 10-13, 15, 16, 18, 24, 25, 27, 28, 33, 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter:

8. Regarding claims 3-5, 10, 11 the prior art fails to suggest or teach "a third feedback switch coupled between a power supply providing a common-mode voltage for the image processing apparatus and the first sampling variable capacitor and a fourth feedback switch coupled between a power supply providing a common-mode voltage for the image processing apparatus and the second sampling capacitor".

9. Regarding claims 6-8, 12, 13, 18, 24, 25 the prior art fails to suggest or teach "a third feedback switch third feedback switch coupled between the feedback capacitor and the first output node of the amplifier, wherein the first output of the differential amplifier couples to the adder".

10. Regarding claims 15,16 the prior art fails to suggest or teach "a second sampling switch coupled between the sampling variable capacitor coupled to the first sampling switch".

11. Regarding claims 27, 28, 33, 34 the prior art fails to suggest or teach "a first and second sampling switch, the first sampling switch coupled to a power supply providing a common-mode voltage for the image processing apparatus, second sampling switch coupled to a predetermined optical black value".

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yogesh K Aggarwal whose telephone number is (703) 305-0346. The examiner can normally be reached on M-F 9:00AM-5:30PM.

12. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Christensen can be reached on (703) 308-9644. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

YKA
October 20, 2004

TUAN HO
PRIMARY EXAMINER